DOE OFFICE OF INDIAN ENERGY

Policies and Programs: Best Practices

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Renewable Energy and Efficiency for Alaska Native Villages

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U.S. DEPARTMENT OF ENERGY | Office of Indian Energy

Presentation Overview

- Understanding policy effectiveness
- Effective policies at different jurisdictional levels

Benefits of Clean Energy Development

- Economic development
  - Cost reductions
  - Employment development
- Energy Self Sufficiency/Reliance
  - Knowledge of system limitation
  - Cost reductions
- Environmental Impact
  - Reduction in land use impact

Accessing Benefits of Clean Energy

Question and Process

- How does policy drive renewable energy development within different state contexts?
- Data Gathering
  - Time series renewable energy development data
  - Cost data (absolute and relative)
- Methods
  - Variety of statistical tests
  - Quantitative model identification using policy and non-policy factors
  - Case Study Development for high penetration states

Defining Policy – in this analysis

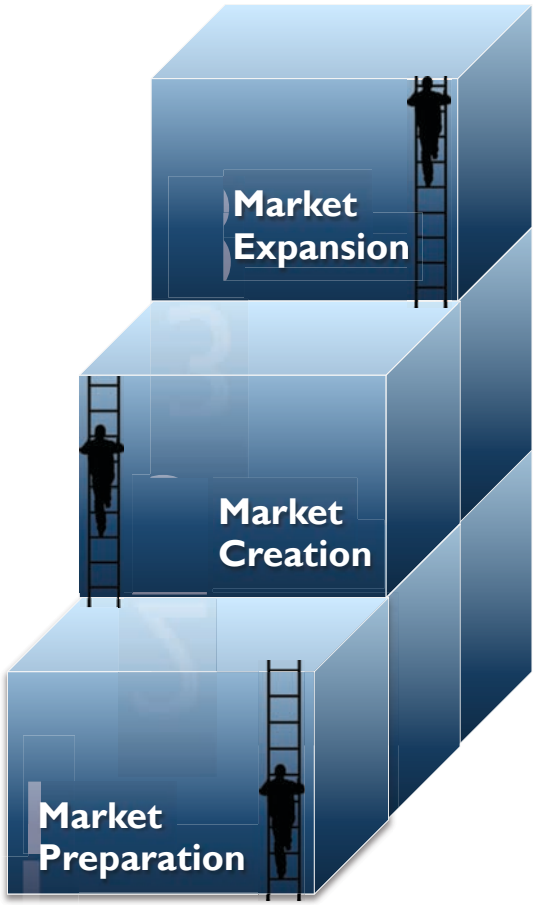
- Focus on distributed generation: 2 MW and below
- Programs and enforceable goals set forth by the governing jurisdiction
- Follows priorities of local governance based on an established goal and plan
- Specific policies outlined on **dsireusa.org**

Primary Findings

- Driving private investment is where market transformation is evident
- Lower cost policies drive investment, bolster higher cost policies
- Access to customers is a critical baseline
- Successful policies are those driven by jurisdictional goals

For full paper: http://www.nrel.gov/docs/fy13osti/56428.pdf

The Role of Policies in States and Localities



Expansion: financing investment

- Niche incentives that target local needs
- Ex. Rebates, production based and investment incentives

Creation: encouraging investment

- Setting long term market certainty to encourage private investment
- Ex. Renewable portfolio mandates, loan programs, variety of financing mechanisms

Preparation: creating an environment for investment

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- Customer access to choice is a critical baseline
- Ex. Interconnection, net metering, permitting

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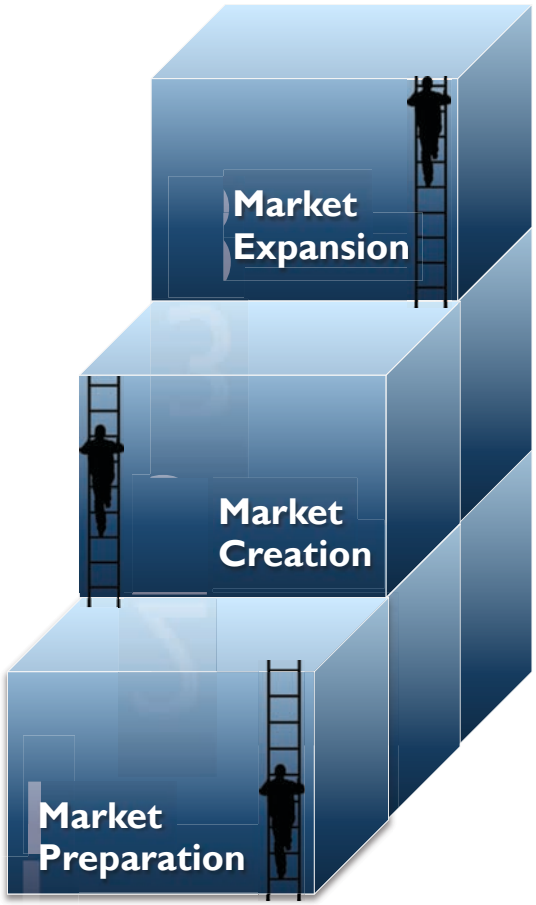

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Grid Access and Valuation

Best Practices

- Wide variety of allowable technologies
- Applicable to all sectors
- Covers all utility types
- 1 MW or higher system size limit
- Aggregate capacity limit higher than 2% of utility peak demand
- Customer retains RECs
- Meter aggregation allowed on common property

	FTG: Interconnection	FTG: Net Metering
AK	N/A	C
CA	A	A
MA	A	A
OR	B	A
VT	C	A

Renewable Portfolio Standards and Goals

Policy	States	Territories
Standard	29	2
Goals	8	2

State	RPS Mandate or Goal
AK	GOAL: 50% by 2025
CA	33% by 2020
MA	22.1% by 2020+
OR	Large utilities: 25% by 2025, Small utilities: 5-10% by 2025
VT	GOAL:* 20% by 2017

- Renewable Portfolio mandates are shown to be effective at reducing investment risk and driving markets
- More complicated/policies that meet local needs policies seem to be working within states

Incentives

- If preparation and creation policies in place: a large variety of incentives from different jurisdictions, even if small, show impact on DG markets
- Full Listing of Incentives for each state Available at DSIREUSA.org

State Level Summary

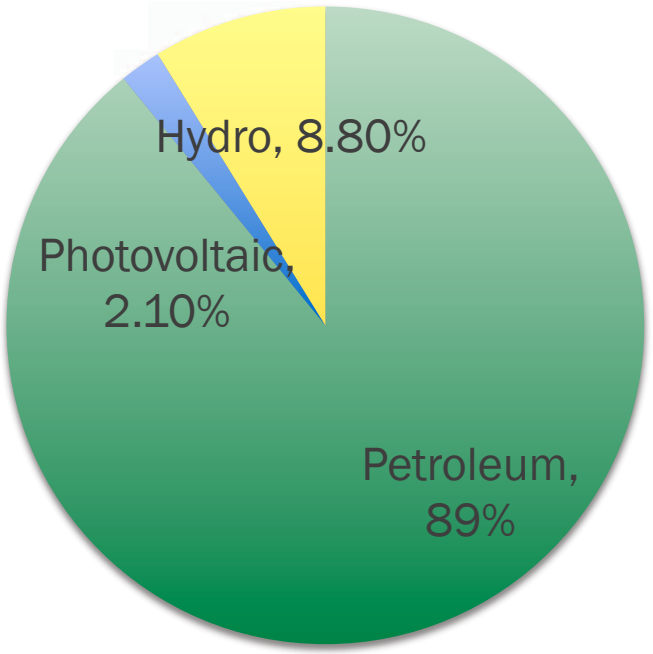
- Low cost, market preparation policies – those that allow consumers and investors to invest regardless of first cost differentials – are correlated to increased development
- Market preparation policies bolster impacts more (perceived) expensive policies - RPS, incentives
- A variety of financing mechanisms – loans, rebates from a number of different levels provide access for a wider variety of stakeholders
- Policies that reflect the need trump what works generally

Kaua'i Island Utility Cooperative (KIUC)

- 32,000 customers
- Required to meet state RPS: 40% by 2030
- Limited equipment access

Class	Rate (2011)
Residential	43 c/kWh
Lighting	44 c/kWh
Large Power	39 c/kWh
Streetlight	57 c/kWh
Irrigation	32 c/kWh

Fuel Mix for Electricity, 2011



Source: http://website.kiuc.coop/content/fuel-mix-information,

KIUC Programs

Priority: Reduction in total electricity costs for low income and elderly (60% of residents)

Program Prioritization: Total Resource Cost (TRC) testing opportunity analysis (http://www.energy.ca.gov/greenbuilding/documents/background/07-J_CPUC_STANDARD_PRACTICE_MANUAL.PDF)

- Efficient Appliance Replacement Rebate Program +qualifying member program
- Appliance Meter Lending Program
- New Member Lighting Program
- Home Visits/Audits
- Solar Water Heater Loan and Rebate Programs

City of Ashland Electric Cooperative

Attributes

- 9,000 residential customers, 93 MWH sold in 2011
- 6.83 Average c/kwh
- Required RPS compliance 10% by 2025
- Own a hydro plant that is 1.6% of sales, rest purchased externally
- Highest % of interconnected systems of any utility in Oregon

Programs

- Green Building Density Bonus
- Residential Energy Efficiency Loan AND rebate programs
- Solar water heating loan AND rebate programs
- Solar PV Rebate program (Net Metering Marketing Program)

Lakeland Electric (FL)

- Florida's oldest (1904) municipal utility serving 100k homes in Lakeland City
- Solar Water Heating lease program
  - City owned and maintained
  - Fixed price for participants ($35/ month)
- Solar Farm – 2011 – SunEdison enters into a power purchase agreement for a 5 MW facility at the airport for the purpose of **long term stabilization of power prices.**

Source: http://www.solarlakeland.com/

Source: lakelandelectric.com/RenewableEnergy/SolarProgram/tabid/414/Default.aspx#top

Key Takeaways

- Support for clean energy development begins with access and low cost policies that open the market for private investment
- Opportunity for all regulatory environments and jurisdictions
- Examples and pathways for all different kinds of utilities

Thank you!

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http://www.nrel.gov/applying_technologies/state_local_activities/

http://energy.gov/indianenergy

SUPPLEMENTAL

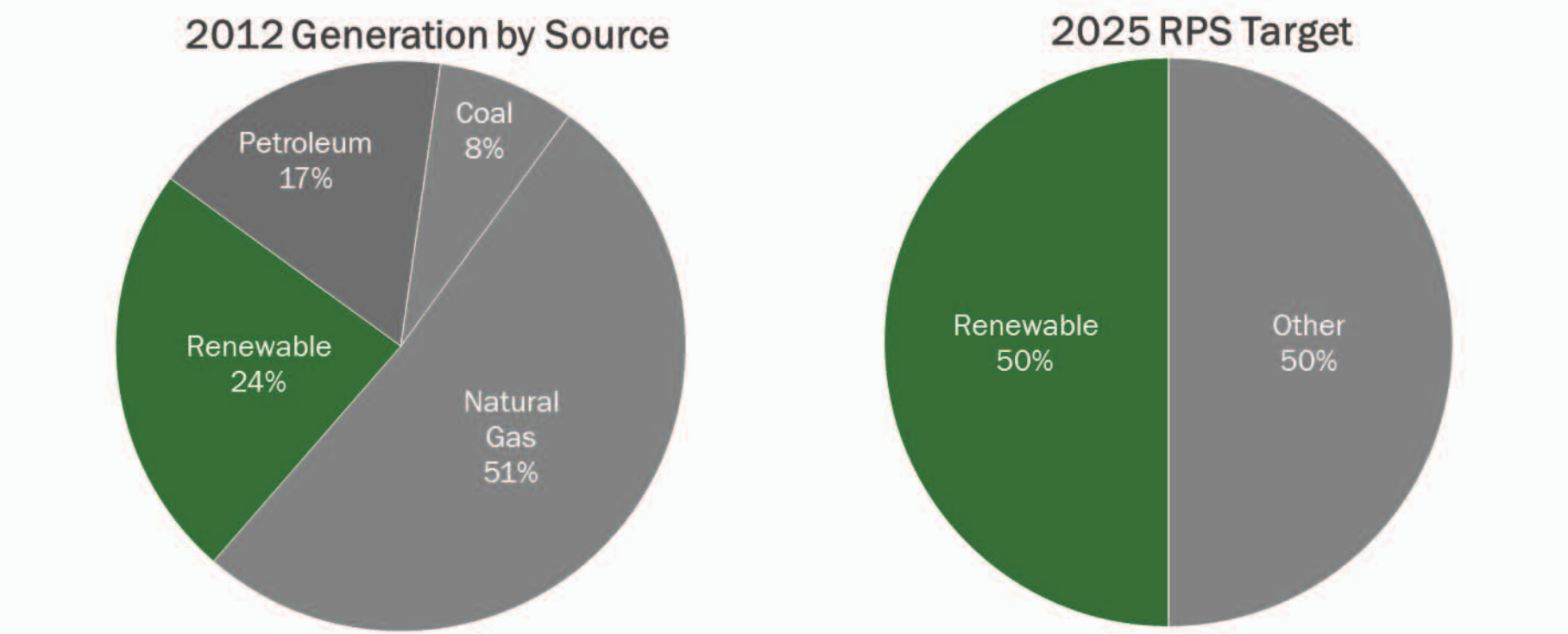
Oregon: Net Metering Policies

- Wide range of prices: 4-12 c/kwh
- Minimum standards
- State legislation and regulation places a minimum on interconnection and net metering rules
- Taking steps to identify public utility implementation to identify potential best practices and improvements

The Alaska Case

- Series of smaller grids
- Public, Cooperative Utilities
- Higher energy costs
- Limited energy access
- History of public investment in energy infrastructure and development

Clean Energy Mandate



SOURCE: Energy Information Administration

Energy Market in Alaska

Table 1. 2010 Summary Statistics

Item	Value	U.S. Rank
Alaska		
NERC Region(s)		--
Primary Energy Source		Gas
Net Summer Capacity (megawatts)	2,067	48
Electric Utilities	1,889	39
Independent Power Producers & Combined Heat and Power	178	51
Net Generation (megawatthours)	6,759,576	48
Electric Utilities	6,205,050	40
Independent Power Producers & Combined Heat and Power	554,526	49
Average Retail Price (cents/kWh)	14.76	5

There is no NERC Region for Alaska. This is shown as "--" in the table.
MWh = Megawatthours.
kWh = Kilowatthours.
Sources: U.S. Energy Information Administration, Form EIA-860, "Annual Electric Generator Report." U.S. Energy Information Administration, Form EIA-861, "Annual Electric Power Industry Report." U.S. Energy Information Administration, Form EIA-923, "Power Plant Operations Report" and predecessor forms.

Residential Electricity Prices (Cents/kWh) 2010

1	Hawaii	39.99
2	New York	18.30
3	Alaska	18.00
4	Connecticut	17.31
5	Vermont	17.02

Electricity Price by Sector (Cents/kWh) - 2012

	Residential	Commercial	Industrial
Alaska	19.31	14.77	17.85
U.S. Avg.	12.04	10.44	7.18

Source: U.S. Energy Information Administration, Form EIA-826, Monthly Electric Sales and Revenue Report with State Distributions Report, July 2012

Alaska Quick Facts

- Alaska's electricity infrastructure differs from that of the lower 48 States in that most consumers are not linked to large interconnected grids through transmission and distribution lines; rural communities in Alaska rely primarily on diesel electric generators for power.

- Alaska ranked fourth in the United States in 2011 in the total amount of electricity generated from petroleum liquids.

- Alaska was one of eight States in 2011 generating electricity from geothermal energy sources.

SOURCE: U.S. Energy Information Administration (EIA), http://www.eia.gov/state/state-energy-profiles.cfm?sid=AK

Top Five Retailers of Electricity – 2010

Entity	Type of Provider	Residential MWh	Commercial MWh	Industrial MWh
1. Golden Valley Elec Assn Inc	Cooperative	304,785	140,257	843,125
2. Chugach Electric Assn Inc	Cooperative	545,123	578,892	45,415
3. Anchorage Municipal Light and Power	Public	143,473	965,307	-
4. Matanuska Electric Assn Inc	Cooperative	435,159	256,040	-
5. Homer Electric Assn Inc	Cooperative	174,990	178,271	116,657
Percent of Total State Sales		77	75	76

- (dash) = Data not available.

Source: U.S. Energy Information Administration, Form EIA-861, "Annual Electric Power Industry Report."

Demand

- Energy demand was nearly 3x the national average in 2010

Total Energy Consumption Per Capita (million Btu) – 2010		
1	Wyoming	948
2	Alaska	899
3	Louisiana	894
4	North Dakota	713
5	Iowa	489

SOURCE: EIA